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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/671,780	09/29/2003	Kazuhiko Nagano	Q77646	1079

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SUGHRUE MION, PLLC  
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WASHINGTON, DC 20037

EXAMINER
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NGUYEN, DUNG T

ART UNIT	PAPER NUMBER
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2828

MAIL DATE	DELIVERY MODE
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06/11/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/671,780	<b>Applicant(s)</b> NAGANO ET AL.	
	<b>Examiner</b> Dung (Michael) T. Nguyen	<b>Art Unit</b> 2828	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 April 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-2, 5-17 is/are rejected.
- 7) ☒ Claim(s) 3, 4 and 18 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2 and 5-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Wong (4730112).

With respect to claims 1 and 9-12, Gibbs shows in Fig.14 a method for stabilizing an optical output of semiconductor laser (laser diode chip), comprising the steps of:

(a) heating the semiconductor laser (16) with a heater (96) when the semiconductor laser is not in operation (column 11, lines 32-67); and

(b) performing **one of first operation stopping heating of the semiconductor laser** (column 11, lines 32-67) almost simultaneously with startup of the semiconductor laser.

With respect to claim 2, Wong discloses said heater heats a vicinity of the semiconductor laser at a heating rate which approximately corresponds to a heat-generation rate at which the semiconductor laser generates heat when the semiconductor laser is in operation, and said first operation is performed almost simultaneously with startup of semiconductor laser (column 11, lines 51-55 discloses that the laser diode laser 16 is brought to temp. T<sub>c</sub> which brings the wavelength of the emitted radiation. That means the heating rate is correspondent to the laser heat generation rate).

With respect to claims 5-8, Wong discloses the semiconductor laser is a multicavity semiconductor laser having a plurality of light emission points (column 5, lines 25-27).

With respect to claims 13-16, Wong shows in Fig.1 said heater 96 comprising a heater wire (connection line (as interpreted by the examiner, the connection line is a wire).

With respect to claim 17, Wong discloses in col.11, l.51-57 said first operation of stopping the heating of the laser.

#### ***Allowable Subject Matter***

Claims 3-4 and 18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The Wong prior art fails to disclose the limitation as recited in the claims.

#### ***Response to Arguments***

Applicant's arguments filed 04/19/07 regarding claims 1-2, 5-17 have been fully considered but they are not persuasive.

- On pages 3-4, Applicant argued that Wong fails to teach the laser diode is heated when the laser is not in operation and the heat applied to the laser by the heat sink is stopped. The examiner does not concur. Examiner wishes to summarize Wong's invention as follows:

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A) Wong's invention is directed to an apparatus for measuring the absorption of a gaseous sample and particularly suitable for measuring the concentration of gaseous oxygen (Abstract). The apparatus monitors oxygen concentration using optical absorption technique (col. 3, lines 27-29). With reference to Figs 5 and 9, the optical absorption technique employs scanning methods (Fig. 5 and col. 6, lines 4-23) and works as follows: a scan waveform generator in Fig. 9 generates a desired diode current modulation on the line 14, and this alternating component (i.e., ac current) is added to a dc component of the diode drive current and the sum is applied to the diode laser 16 and the diode 16 emits radiation which is collected by lens 24 and formed into beam 26 (col. 7, lines 39-46). Note that, at this point it is clear that the diode laser 16 is driven by a drive current which is the sum of dc current ( $I_{dc}$ ) and ac current (scan waveform either linear (Fig.5), square pulse (Fig.6), or sinusoidal (Figs. 7 and 8)). The beam 26 passes through a sample of oxygen 30, waveform comparator 38 and then the resulting signal inputs to the dividing circuit 46 that calculates the fractional absorption by oxygen that was to be measured (Fig.9). The measured absorption line at  $\lambda_0$  determines the concentration of oxygen. See Fig. 5 for the detection of the absorption line at  $\lambda_0$  when the scan wavelength is in the interval  $\lambda_1$  to  $\lambda_2$ .

B) Turning to Fig. 14, since the diode laser 16 is itself a heater (col. 9, line 64) and in some applications, the heater 96 is provided to control the temperature of the diode 16 (col. 10, lines 2-21). The apparatus of Fig. 14 works as follows: the apparatus of Fig. 14 has a coarse and a fine wavelength control system (col. 11, lines 33-35). The coarse system makes use of the heater 96 thereby indirectly altering the temperature of the laser diode 16 (col. 11, lines 35-40).

The heater 96 is driven by providing a supply current to the heater (col. 11, lines 49-51).

Through the use of this coarse control system, the diode laser 16 is brought to approximately the temperature  $T_c$  which brings the wavelength of the emitted radiation to within a scan interval of the chosen wavelength  $\lambda_c$  (col. 11, lines 52-55). At this point the switch 123 is opened and the switch 117 is close to initiate operation of the fine control system (col. 11, lines 55-57).

After the operation of the fine control system is done the switch 117 is opened and the switch 15 is closed to initiate the wavelength scanning action used in the absorption measuring process (col. 12, lines 19-23).

In short the apparatus of Fig. 14 is operated according to the following sequences:

- a) Switch 123 closed, switch 117 opened, switch 15 opened to initiate the coarse control system to **heat** the diode laser to the temperature  $T_c$ , then
- b) Switch 123 opened, switch 117 closed, switch 15 opened to initiate the fine control system, and finally
- c) Switch 123 opened, switch 117 opened, switch 15 closed to initiate the wavelength scanning action used in the absorption measuring process.

As described above, the heater 96 heats the diode laser 16 to the temperature  $T_c$  which brings the wavelength of the emitted radiation to within a scan interval of the chosen wavelength  $\lambda_c$ . That is, the heater provides heat to the diode laser **as if** the diode laser was generating heat when operating (emitting radiation) to within a scan interval of the chosen wavelength  $\lambda_c$  **even though the diode laser 16 is not actually operated** by a driven scanning waveform (see Fig. 14, switch 15 opened, no scanning waveform applied to the diode laser).

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- On pages 4-5, Applicant argued that Wong does not discuss the heating wire. The argument is not persuasive because, as interpreted by examiner, the claims 13-16 recite the heater **comprising** a heating wire (not the heater being a heating wire) and Wong does show a wire connected to the heater 96 (heating wire).

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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### Communication Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dung (Michael) T Nguyen whose telephone number is (571) 272-1949. The examiner can normally be reached on 8:30 - 17:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Min Harvey can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-3329.



Michael Dung Nguyen

5/26/07